DOCUMENT RESUME

ED 246 195 CE 039 170

AUTHOR Seng, Law Song
TITLE Technological Education in Singapore: A Country Report. VITB Paper No. 3.
INSTITUTION Vocational & Industrial Training Board, Singapore.
PUB DATE 84
NOTE 28p.; Paper presented at the Silver Jubilee Seminar on "Technological Education in Asean: Issues and Options for the 80's" (Shah Alam, Selangor, Malaysia, December 10-12, 1981).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Educational Change; *Educational Development; *Educational History; Foreign Countries; Labor Force Development; Postsecondary Education; Secondary Education; *Technical Education; Vocational Education; *Vocational Training Centers
IDENTIFIERS *Singapore

ABSTRACT

The objective of this paper is to provide a comprehensive review of the total system of technological education in Singapore. The educational system, its history, and its response to technological needs are first briefly described. A discussion follows of the evolution of the various infrastructures, including the National University of Singapore, Singapore Polytechnic, Ngee Ann Technical College, the Vocational and Industrial Training Board (VITB), Economic Development Board training centers, and VITB-approved training centers. Some major changes that the various infrastructures within the total education and training system have made to respond to economic restructuring in the 1980s are then described. These include the New Education System in the schools, school program revision, a VITB project to develop a Resource and Staff Training Centre, expansion of computer studies, and the recommended establishment of the Nanyang Technological Institute to train engineers. (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED246195

TECHNOLOGICAL EDUCATION IN SINGAPORE: A COUNTRY REPORT

Dr. Law Song Seng
Director
Vocational & Industrial Training Board
Singapore

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

L S Seng

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

VITB Paper No. 3, 1984

CE 039170

This paper was first presented at the Silver Jubilee Seminar on "Technological Education in Asean : Issues and Options for the 80's", Institut Teknologi MARA, Shah Alam, Selangor, Malaysia, 10 - 12 Dec 1981.

It is reprinted as a VITB Paper in view of its professional interests to others in the vocational and industrial training field.

Vocational & Industrial Training Board

CONTENTS

Abstract 1

Introduction 2

The Educational System 4

Educational & Training Infrastructures 6

Developmental Changes 14

Summary 19

References 20

Figure 22

Acknowledgements 24

ABSTRACT

The objective of this country paper is to provide a comprehensive review of the total system of technological education in Singapore. In its broadest sense, the education and training system not only encompass the schools, vocational institutes, industrial training centres, polytechnics and university but the supporting role of the private industries. In particular, the training infrastructures, their historical development and dynamic responses to the changing socio-economic priorities of the country are described. The developmental changes in the light of Singapore's new economic restructuring for the 1980's are also discussed.

INTRODUCTION

In its broadest sense, the system of technological education which normally comprises the government institutions which train professional engineers, technicians and skilled tradesmen, is only part of the total educational and training system of a country.

It is difficult to treat technological education outside the broader framework of education because the schools are the springboard for the training of technical and skilled manpower. That is, education and training are closely interrelated and must be compatible if subsequent training is to be carried out effectively.

As much as a government may wish to shoulder the responsibility for manpower development, and in particular, technical manpower, it is unlikely to succeed without the complementary role of the users (industries). By its very nature, technical and skilled training is incomplete without the experience which can only be acquired on the job. The partnership of private industries in supporting training should therefore be viewed as an integral part of the total system.

Outside the total education and training system are the overseas institutions which have been instrumental in the training of many Singaporeans in the various stages of industrial development. This available resource is still important for the upgrading of technical skills and acquisition of new skills which are unavailable locally.

In this paper, the education system, its history and response to technological needs are first briefly described. This is followed by the evolution of the various infrastructures (the tertiary institutions, polytechnics, vocational institutes and skill training centres) which have taken place as a response to the economic restructuring in the 80's are discussed.

THE EDUCATION SYSTEM

In Singapore, from the colonial to the post war era, education was provided by the colonial government's English-medium schools and the ethnic association's vernacular schools. This state of affairs is continued until the late 50's and early 60's, when the People's Action Party came into power in 1959. Since then educational policy has sought to build a united national education system based on the principle of parity of treatment for the four official language streams, namely, Malay, Chinese, Tamil and English. Already, there was recognition of and an emphasis placed in the teaching of science and technical subjects in preparation for the manpower requirements of industrialisation.

However, up to 1968, the existing secondary school system was heavily biased towards academic education. Among the 1967 secondary school-leavers, only 6% had received technical education. From 1969, technical education was introduced to all Secondary I students as part of the school curriculum and in 1970, aptitude testing of Secondary II students was conducted for the purpose of channelling students into academic, technical and commercial streams. A separate Technical Education Department was established in the Ministry of Education to administer technical education and industrial training programmes, which was re-organised in 1973 to form the Industrial Training Board (ITB).

At another level was the Adult Education Board (AEB) providing continuing education in the academic, commercial and other vocational fields, in addition to enrichment courses. In April 79, the AEB and the ITB were merged through an Act of Parliament to form the Vocational and Industrial Training Board (VITB) whose functions will be

dealt with in greater detail in the later part of this paper. Suffice to note at the moment that the whole process of technical and vocational education underwent continuous changes within the academic system in the 60's and 70's to suit our changing economic and social development strategies.

Where post-secondary education is concerned, technical education and industrial training were provided at three institutions, the Singapore Polytechnic, Ngee Ann Technical College and the Singapore Technical Institute. University education came under the charge of the then Nanyang University and the University of Singapore.

It is quite evident that education has been viewed as an important vehicle towards economic growth by the Singapore government. With no natural resources and limited land size, Singapore has placed the highest priority to develop the maximum potential of its people through education and training in order to move up the industrial ladder. The next section of the paper will describe the various infrastructures that had been developed to achieve that goal.

EDUCATIONAL AND TRAINING INFRASTRUCTURES

Development Of National University Of Singapore (NUS)

It is of interest to note that in many developed and developing countries, as is in Singapore, the birth of technological eduation, can be traced to the tertiary institutions. Historical data is standing testimony to this fact. The Straits Settlements and the Federated Malay States Government Medical School (or the King Edward VII College of Medicine, as it was later called) was established in 1905. This was followed by the setting up of Raffles College for the Study of Arts and Science in 1929. After the War, the King Edward VII College of Medicine and Raffles College were amalgamated in 1949 to form the University of Malaya. The attainment of Independence in Malaya in 1957 led to the division of the University of Malaya into two autonomous divisions in 1959. In 1962, the division in Singapore became the University of Singapore and that in Kuala Lumpur, the University of Malaya.

The University of Singapore offered degree courses in the Arts and Social Science, Sciences, Law, Medicine, Dentistry, Pharmacy, Engineering, Architecture, Accountancy, Business Administration as well as post-graduate medical studies.

The Chinese Community, wanting to provide higher education in the Chinese medium for local Chinese High School leavers, established the Nanyang University (NU) in 1956. Though meant to be a Chinese medium University, from early 70's, the NU changed its outlook to suit the changing needs of a restructured Singapore economy. Many of the

courses offered were conducted in English by 1975. It offered courses leading to the Bachelor and higher degrees in Arts, Science and Commerce.

A decision was taken to merge the two universities in 1980, thus establishing the National University of Singapore (NUS). It was felt that the combined resources in one campus would help to develop stronger departments of higher quality, reduce central administrative costs and create greater opportunities for multi-disciplinary teaching and research.

The NUS offers courses leading to Bachelor Degrees and (with few exceptions) higher degrees in Accountancy, Architecture, Arts, Building, Business Administration, Dentistry, Engineering, Estate Management, Law, Medicine, Pharmacy, Science and Social Sciences. Admission to the University is based on the GCE 'A' level qualification. In line with the overall upgrading of the education system, the university enrolment has also shown a tremendous increase. The combined University enrolment for the two universities in 1968 was 5,700. This figure has expanded to nearly 10,000 for the 1980/81 session. It is envisaged that by 1990, there would be a total enrolment of at least 15,000 students doing full-time courses.

Singapore Polytechnic

Established in 1954, the Singapore Polytechnic now offers technician diploma courses in civil, electrical, electronics and communications, mechanical, production, marine engineering, building and chemical process technology. It also provides for technician certificate courses in architectural drafting, aeronautical maintenance engineering, maritime radio-communication and various other courses for nautical studies.

In the beginning, diplomas at craft, technician and professional levels were awarded. During 1963/64 academic year, the craft courses were transferred from the Polytechnic to the then Balestier Junior Trade School which later became the Singapore Vocational Institute. In 1969,

the School of Accountancy and the degree courses of the Schools of Engineering, and Architecture and Building were transferred to the then University of Singapore. By 1972/73, the Polytechnic had ceased to conduct Degree, Professional Diploma and craft level courses, and concentrated only on Technician Diploma/Certificate courses as well as Post-Diploma/Certificate courses.

In response to the national call for greater opportunities for industrial personnel to upgrade their levels of expertise, the Polytechnic re-introduced its part-time evenings only courses in electrical and communication engineering and mechanical and production engineering with effect from the 1979/80 session. In addition to all the formal full-time and part-time courses, the Polytechnic also offers a wide range of short courses to cater to the more specific needs of industries, ranging from courses in the areas of Environmental Control, Modern Injection Moulding to Code of Practice 110.

Admission into full-time and part-time courses has been based on the GCE 'O' level passes in the relevant subjects until 1980 when candidates with GCE 'A' level qualification are admitted directly to the second year of the three-year Technician Diploma courses.

The enrolment over the last 20 years has shown a tremendous increase. When the 1960/61 session started, there was a total of 2,249 full-time and part-time students. The 1970/71 figure was 4,034, and by the 1980/81 session, total enrolment for both the full-time and part-time courses was 8,385, an increase of 370%, indicating the trends of development of technical education in Singapore, to meet the rapidly increasing demands of our economy.

Ngee Ann Technical College

The Ngee Ann Technical College was established in 1963 as an independent college offering 4-year degree courses in arts, science and commerce. To meet the growing needs of industry and commerce in Singapore, the College became a public institution of higher learning in 1967. The

degree courses were phased out in place of Technician Diploma Courses at the level similar to the Singapore Polytechnic. The medium of instruction is English.

Presently, the College is offering full-time courses in mechanical engineering, shipbuilding and repairing technology, electrical and electronic engineering, building maintenance and management and business studies. In addition, the Business Studies Department introduced the Diploma Course in Industrial Management in 1978/79 with the approval of the Institute of Works Managers.

Admission to the College is based on the GCE 'O' level examination results. Intakes for the various departments have been on an increase. Total enrolment for the five departments was 2,735 for the 1974/75 session. For the 1978/79 session, this figure had increased to 4,419.

The Vocational & Industrial Training Board (VITB)

The impetus for skilled manpower training was recognized as part of the overall plan to diversify the economy in the early 1960's. In 1968, a Technical Education Department was formed within the Ministry of Education to promote the technical stream of education under a new education policy. Existing vocational and trade schools were upgraded into "Secondary Vocational Schools". Vocational training was then perceived to be part of the formal educational system.

The need to increase the supply of skilled labour to meet the requirements of the many industries being set up in the early 1970's, saw the establishment of the Industrial Training Board (ITB) in 1973, from the nucleus of the Technical Education Department. One of the Board's main objectives was to provide each trainee with a broad-based training in a major trade area. In its efforts to integrate formal learning and industrial practice as rapidly as possible, the ITB also implemented various apprenticeship schemes, making industry a partner in the Board's training efforts.

Over the years, the ITB had substantially established the infrastructure to provide basic industrial training in a variety of skills, making industrial training available as an alternative and parallel path of personal development. The demand for higher levels of training from both the industries and the trainees resulted in further expansion of the ITB in both its function and capacity. The implementation of the New Education System and the announcement of the launching of the Second Industrial Revolution in late 1970's brought about the amalgamation of the ITB and the Adult Education Board (AEB) and the formation of the present Vocational and Industrial Training Board (VITB).

The principal objectives of the VITB, as stated in the VITB Act 1979, are as follows :-

1 To provide for, promote, assist in and regulate the training or apprenticeship of persons in or intending to be employed in commerce or industry, and to upgrade the skills of such persons by providing advanced training in skilled work or otherwise.

2 To establish the nature and length of the training for any employment in commerce or industry, and the further education to be associated with the training, the persons by and to whom the training ought to be given, the standards to be attained as a result of the training and the methods of ascertaining whether those standards have been attained.

3 To conduct such programmes of further education as may be required from time to time.

VITB thus, is the single national authority and agency for the development, provision and regulation of vocational and industrial training in Singapore, with concommittant responsibility for continuing education. It is concerned with vocational preparation for work in commerce or industry at the skilled level, embracing the spectrum from artisan, junior technician and advanced craftsman to sub-professional. VITB is also the national authority for

the registration and regulation of apprenticeship training.

The Board currently conducts full-time and part-time courses at its 17 training institutes. Trade courses are structured into three levels, viz the National Trade Certificate Grade 3 (NTC-3) (basic semi-skilled), the NTC-2 (skilled worker) and NTC-1 (advanced), which has not been introduced yet. In addition, Certificate of Competency (CoC) Courses, provide training at the skilled level in very specific areas. Skills attained by trainees following this category of courses are narrow in scope and terminal in nature.

Post-secondary vocational training is structured into Certificate-level (2 years) and Diploma-level (3 years) programmes. The Industrial Technician Certificate (ITC) programme provides skill and supervisory training to develop trainees into technicians and junior supervisory staff, by integrating both theoretical and practical lessons into the course outline. Certificate in Business Studies (CBS) are also offered. The Diploma courses, introduced for Applied Arts (DAA), provides the training aimed at developing the trainee to the level where he is capable of practising as a professional. There are presently, a total of 2 DAA, 40 NTC, 7 ITC, 3 CBS and 10 CoC courses which cover the industrial, commercial and service sectors of industry.

Entry into vocational training is provided for at any level after primary education to encourage flexibility for transfer from the education system, and to minimise our educational wastage. The various points of entry from the educational system to the vocational system are illustrated in Figure 1. The Board has a total full-time trainee enrolment of 10,000 in 1980 in its 17 training institutes.

One of VITB's major roles is promoting training in partnership with industries such as apprenticeships, company in-plant, industry-group training and joint-training centres.

Under an apprenticeship scheme, the institutional and on-the-job training components are specified within a contractual agreement and supervised by the Board. The commit-

ment in the apprentcieship programme is reflected in the number of participating firms. In 1979, there were a total of 156 sponsoring firms, and in 1980, 270, an increase of 73%. In the year ended 1980, there were a total of 5,133 apprentices still in training, while 1,242 apprentices completed training during the same year.

Another component of the Board's training system is continuing education where part-time courses of different durations and levels on industrial skills, commercial subjects, general education, languages and enrichment for these courses is about 30,000 a year.

Economic Development Board Training Centres

Apart from the VITB institutions, another avenue for training is provided by the training centres established by the Economic Development Board (EDB) under the Joint Industrial Training Scheme. Under this scheme, the EDB and Multi-National Corporations (MNC's) jointly set up training centres for targetted industries. Between 1972 and 1979, four such joint centres have been set up for the metal precision engineering trades and the camera industry. Training follows the apprenticeship model and is conducted at the NTC 2 level of skills.

Jointly financed by our government and the major industrial firms of TATA, Philips, Rollei and the Japanese government, these centres have provided pioneer firms with the skilled craftsmen that have been required in Singapore's early industrialisation programme.

Enrolment into these training centres is restricted to those school leavers with Secondary 4/Technical 4 qualifications or graduates of the Vocational Institutes with NTC 3 qualifications. The apprenticeship covers a 4-year training scheme whereby the first 2 years will be spent in the training centres, undergoing full-time workshop practice and theoretical instruction under factory-like conditions. The apprentices continue their skill acquisition and experience when subsequently placed in selected companies.

These centres pioneered full-time NTC 2 training in

the 1970's. With VITB now playing pivotal role in providing for NTC 2 full-time training, these centres are expected to pioneer new specialised skill areas and training at levels leading to the NTC 1. Total enrolment of the four training centres stood at 1,240 at the end of 1980 as compared to 953 the previous year. Two more such centres are now in the offspring, namely the French's and the German Government's training centres.

VITB Approved Training Centres

The training provided by VITB and the EDB centres are essentially basic and institutional in nature. Apart from these training centres, certain industries have now set up their training schools, in conjunction with VITB. Firms which have adequate training facilities for the training of NTC 3 or NTC 2 level technicians are accepted by VITB as Approved Training Centres. The advantage of these in-plant training is that the programmes can be tailored to the specific needs of the companies while at the same time ensuring the requisite standards of training to meet VITB's certification.

Up to this year, 10 firms have been given Approved Training Centre status by VITB. Most of the trainees with these training centres are school leavers and National Service reservists and the ten training centres together have an annual intake capacity of over 2,600 trainees for training leading to the Certificate of Competency, NTC 3 and NTC 2 levels.

It is desirable and expected that with government encouragement in terms of monetary grants under the Skills Development Fund, more firms will in future undertake their own training schools to complement the VITB and EDB training centres.

DEVELOPMENTAL CHANGES

Singapore has embarked on an economic strategy of high growth rates, capital-intensive technology, high skills and quality products for the 1980's. Manpower training to meet the needs of the new breed of industries is seen as a top priority task in the overall plan of economic development. As a result, the various infrastructures within the total education and training system have responded in various ways to meet the task ahead. Some of these major changes are described below.

Schools

A New Education System with the flexibility to accommodate pupils of different learning abilities was introduced in 1980. With this system, is the provision for an alternate route of education and training with VITB.

At the school level, more time has been allocated to the study of the languages, Sciences and Mathematics. All students are streamlined at various stages and placed into different streams and courses in accordance to their abilities and interests. For GCE 'A' level students, computer studies has been introduced, in keeping in line with the projected expanded role of computers in our re-structured economy. Forty-eight schools already have one micro-computer each installed earlier this year. Another 43 schools will also have a micro-computer each by end of the year. In addition, 170 secondary schools will have an average of three micro-computers by 1985 to boost computer education in the schools.

The Curriculum Development Institute of Singapore will have a resource centre to serve computer users, including teachers and students. More than 100 teachers have already completed a 100-hour course at the Institute, gaining basic computer knowledge, while another 80 teachers are now undergoing the course. It is envisaged that more and more students will be taking up computer studies and more teachers will be trained to cope with the increase.

Vocational & Industrial Training Board (VITB)

Developmental changes in the VITB are aimed at improving its system of training and meeting the skilled manpower needs of industries in the industrial, commerce and service sectors. The Board has planned for the implementation of two institutes of commerce with a training capacity of 4,000 trainees in various certificate courses in Business Studies. New vocational institutes will also be built to increase the training capacity projected for new and upgraded engineering trades. The improvement and expansion in a number of existing training institutes are underway. The Board is gearing itself to provide a projected 25,000 training places by 1985 as compared to its 13,000 capacity.

The partnership role of the private industries through apprenticeship schemes, approved training centres and specific ad hoc centres is being actively promoted. With the available training grants of the Skills Development Fund, it is in the interest of employers to participate actively with VITB in manpower training.

A crucial factor in the success of Singapore's second industrialisation plan is not just the quantity in manpower but the quality of the skilled manpower. The Board is therefore undertaking a project to develop a Resource and Staff Training Centre (RSTC) to improve the quality of its training system. Specifically, the functions of RSTC are :-

1 To provide pedagogic training for newly recruited trainers.

2 To conduct upgrading programmes for existing training staff to help them to keep abreast with

the latest instructional methodology and techniques and in applying them.

3 To evaluate and determine training needs and curriculum based on manpower projections.

4 To develop new institutional training programmes and apprenticeship training programmes to meet the specific needs of industries.

5 To develop instructional materials and audio-visual aids to facilitate training.

Computer Studies

The computer and information systems industry has been identified as one of the key industries for the 1980's. A number of training institutes have been established and new programmes introduced to train the various levels of computer personnel.

At the apex, is the Institute of Systems Science (ISS) set up as part of NUS with the mission of transferring the state-of-the-art information technology from overseas to the local industry.

As an industry oriented training institute, the ISS will be responsible for turning out information systems practitioners of varying levels of skills. It will provide leadership in higher levels of information systems training covering management and user education to advanced training for data processing specialists. ISS courses will be practically oriented, focussing on the production of system analysts, information system managers and specialists who can manage and control software development efficiently and effectively, and who can analyse, design and develop sophisticated applications using appropriate software tools, techniques and methodologies.

The Department of Computer Science at the NUS has been offering computer courses to university entrants. With the new direction and emphasis, the department has now revamped its course syllabus, is expanding its capacity and

has introduced honours courses in computer science. The courses are supported by the data processing facilities of the Computer Centre at the NUS.

A Japan-Singapore Institute of Software Technology (JSIST) was established as yet another ancillary measure for the training of computer personnel and the promotion of software companies in Singapore. The JSIST, to be fully functional by early 1982, is a $6m computer training centre jointly set up by the Singapore and Japanese Governments.

It is envisaged that the Institute will produce 50 programmers a year, of which 25 will be further trained as senior programmers. Another 75 senior programmers and 150 systems analysts will also be trained every year. At the same time, the JSIST plans to be able to provide computer appreciation courses to 75 managers a year and will conduct special seminars for Data Processing professionals.

Nanyang Technological Institute (NTI)

The necessary increase in training capacities is projected at all levels of professional, technical and skilled manpower at the VITB, Singapore Polytechnic, Ngee Ann Technical College and the National University of Singapore.

At the University level, the planners have projected the need for a dramatic increase in the output of engineers to the order of 1,000 a year and recommended the establishment of a separate training institution namely, the Nanyang Technological Institute (NTI).

It was also identified that two distinct types of engineers will be required: the academically-oriented engineers and practice-oriented engineers. The Faculty of Engineering of the National University of Singapore wil continue to conduct the academically-biased programme, while the NTI which will have its first batch of some 500 students in July 1982 will provide the practice-oriented programme. Both courses will be of 4 years' duration, and all students will undergo a common first year course in the Faculty of Engineering at the NUS.

Whereas engineers trained by the NUS are expected to work as research and development engineers, the NTI graduates are expected to perform their roles in manufacturing, maintenance and service more effectively. The emphasis in the latter will be engineering applications and less on theory.

As an integral part of the course, students will undergo professional training within the institute and by attachment to the industries. The three schools of engineering, namely, the Civil and Structural Engineering, the Electrical and Electronic Engineering, and the Mechanical and Production Engineering Schools will provide specialised training within the broad discipline especially at the Fourth Year.

SUMMARY

In this paper, technological education is viewed as an integral part of the broader system of education and training as a basis for a comprehensive review of the various infrastructures which collectively support manpower training in Singapore.

This premise not only recognizes the necessary contribution of private industries in manpower development but actively seeks their participation. Apprenticeship schemes for the training of skilled manpower provides a good example where this close partnership between the training institutions and employers should and could be fostered.

It is seen that technological education exists to meet the needs of a country's economic development. As such, it is necessary that the infrastructures response according to the changing needs of technology and manpower in industries. The changes in education and training programmes and the establishment of new institutions reported in this paper are but a response to the restructuring of a new economic strategy for Singapore in the 1980's.

REFERENCES

1 Department of Statistics, Yearbook of Statistics, Singapore, 1980-81, Singapore, 1981.

2 Goh Keng Swee and the Education Study Team , Report on the Ministry of Education 1978, Singapore, 1979.

3 Kuo, C Y Eddie, "Life-Long Education and Social Development in Singapore - A Country Report", Thirteenth ASAIHL General Conference and Seminar on Life-Long Education and the Role of ASAIHL, 14 - 17 January, Manila, 1981.

4 Law, S. S., "Industrial Engineering in Singapore's Industrialization", South East Asian Industrial Engineering Conference, Institution of Industrial Engineers (Australia), Singapore, July 1981.

5 Ministry of Education, Education in Singapore, Singapore, 1972.

6 Nanyang Technological Institute, Engineering Studies at the Nanyang Technological Institute, Singapore, 1981.

7 Ngee Ann Technical College, Annual Report 78/79, Singapore, 1979.

8 Singapore Economic Development Board, Annual Report 80-81, Singapore, 1981.

9 Singapore Polytechnic, Annual Report 79/80, Singapore, 1980.

10 Syddall, Peter, "Country Paper on Technical Education and Vocational Training in Singapore", Bulletin of the Unesco Regional Office for Education in Asia and Oceania, No. 21, Bangkok, 1980.

11 University of Singapore, Annual Report 79/80, Singapore, 1980.

12 Vocational and Industrial Training Board, Annual Report 80-81, Singapore 1981.

FIGURE

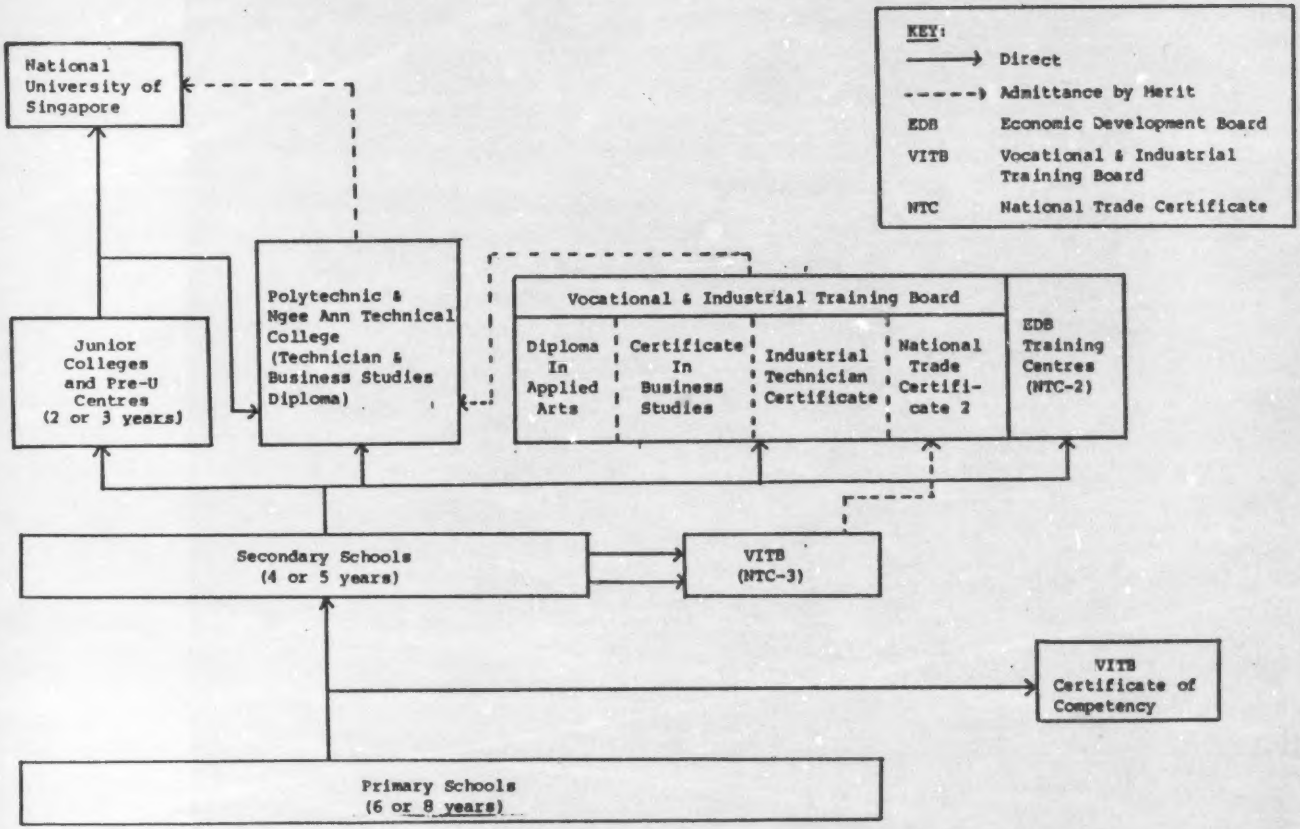
KEY:
Direct
Admittance by Merit
EDB Economic Development Board
VITB Vocational & Industrial Training Board
NTC National Trade Certificate
National University of Singapore
Polytechnic & Ngee Ann Technical College (Technician & Business Studies Diploma)
Junior Colleges and Pre-U Centres (2 or 3 years)
Vocational & Industrial Training Board
Diploma In Applied Arts
Certificate In Business Studies
Industrial Technician Certificate
National Trade Certificate 2
EDB Training Centres (NTC-2)
Secondary Schools (4 or 5 years)
VITB (NTC-3)
VITB Certificate of Competency
Primary Schools (6 or 8 years)

Figure 1- Entry To VITB Courses Within The Education System

ACKNOWLEDGEMENTS

The assistance of the External Relations Department and the Instructional Media Division in the preparation of this paper is gratefully acknowledged.